

What we claim is:

1. A fuel injector for metering, atomizing and spray targeting of fuel, the fuel injector comprising:
 - a seat including a passage extending along a longitudinal axis;
 - a movable member cooperating with the seat to permit and prevent a flow of fuel through the passage; and
 - a metering orifice disc including:
 - a member including first and second generally parallel surfaces, the first surface generally confronting the seat, and the second surface facing opposite the first surface; and
 - an orifice penetrating the member and being defined by a wall coupling the first and second surfaces, the wall including:
 - a first portion spaced from the first surface, the first portion of the wall extending substantially perpendicular to the first and second generally planar surfaces; and
 - a second portion coupling the first portion to the first surface, the second portion of the wall extending at a first oblique angle with respect to the first surface, and the first oblique angle varying with respect to the longitudinal axis.
2. The fuel injector according to claim 1, wherein the orifice targets a spray of fuel along an angular path with respect to the longitudinal axis.
3. The fuel injector according to claim 2, wherein the first and second surfaces define respective generally parallel planar facets such that each of the generally planar facets is oblique to the longitudinal axis.

4. A metering orifice disc for a fuel injector including a passage extending between an inlet and an outlet, and a seat proximate the outlet and cooperating with a closure member to permit and prevent a flow of fuel through the passage, the metering orifice disc comprising:

a member including first and second generally parallel surfaces, the first surface being adapted to generally confront the valve seat, and the second surface facing opposite the first surface;

an orifice penetrating the plate and being defined by a wall coupling the first and second surfaces, the wall including:

a first portion spaced from the first surface, the first portion of the wall extending substantially perpendicular to the first and second generally planar surfaces; and

a second portion coupling the first portion to the first surface, the second portion of the wall extending at a first oblique angle with respect to the first surface, and the first oblique angle varying so as to define an asymmetrical chamfer.

5. The metering orifice disc according to claim 4, wherein the orifice extends along an orifice axis generally perpendicular to the first and second generally parallel surfaces.

6. The metering orifice disc according to claim 5, wherein the first oblique angle varies about the orifice axis.

7. The metering orifice disc according to claim 5, further comprising:

a first perimeter being defined by a juncture of the first surface and the second portion of the wall, the first perimeter being asymmetrical about the orifice axis.

8. The metering orifice disc according to claim 7, wherein the first perimeter is eccentric with respect to the orifice axis.

9. The metering orifice disc according to claim 7, further comprising:
a second perimeter being defined by a juncture of the first and second portions of the wall.
10. The metering orifice disc according to claim 8, wherein the second perimeter lies in an oblique plane with respect to the orifice axis.
11. The metering orifice disc according to claim 5, wherein the wall comprises a third portion coupling the first portion to the second surface.
12. The metering orifice disc according to claim 11, wherein the third portion of the wall extends at a second oblique angle with respect to the second surface, and the second oblique angle being generally constant about the orifice axis.
13. The metering orifice disc according to claim 11, wherein the third portion of the wall comprises an irregular surface.
14. The metering orifice disc according to claim 12, further comprising:
a third perimeter being defined by a juncture of the second surface and the third portion of the wall, the third perimeter being irregular and asymmetrical about the orifice axis.
15. The metering orifice disc according to claim 14, wherein the first and second surfaces define respective generally parallel planar facets such that each of the generally planar facets is oblique to the orifice axis.
16. A method of forming an metering orifice disc for a fuel injector, the metering orifice disc including a member having first and second generally parallel surfaces, the method comprising:
forming an orifice penetrating the member, the orifice being defined by a wall coupling the first and second surfaces, and the orifice extending along an orifice axis generally perpendicular to the first and second generally parallel surfaces; and

deforming the orifice proximate the first surface, the deforming including forming at least one asymmetrical chamfer with respect to the orifice axis.

17. The method according to claim 16, wherein the forming the orifice comprises at least one of punching, drilling, shaving, and coining.

18. The method according to claim 16, wherein the deforming the orifice comprises at least one of punch forming and coining.

19. The method of claim 16, wherein the deforming further comprises dimpling a region on which the orifice is disposed thereon such that the region forms a facet having a plane oblique to the orifice axis.